



Marine Air Conditioners Service Manual

GREE ELECTRIC APPLIANCES INC. OF ZHUHAI

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PRODUCT

PRODUCT

1. MODELS LIST

Model	Capacity		Ref.	Power Supply	Appearance
	Cooling (Btu/h)	Heating (Btu/h)			
CYR7/Na-K	7200	7500	R410A	220-240V 1Ph 50Hz	
CYR9/Na-K	8900	9500			
CYR12/Na-K	11900	13000			
CYR16/Na-K	15700	16200			

Note: 1Ton = 12000Btu/h = 3.517kW

2. NOMENCLATURE

C Y	S	R	☐	/	☐	-	☐
1	2	3	4		5		6

NO.	Description	Options
1	Unit Series Type	CY: marine air conditioner
2	The Type of the Unit	Cold/Hot Air Default; Cold/Hot Water S
3	Function Characteristics	Heat Pump R; Heat Pump with Auxiliary Electric Heater Rd; Cooling-only Default
4	Nominal Cooling Capacity	7=7000Btu/h 9=9000 Btu/h 12=12000 Btu/h 16=16000 Btu/h
5	The Type Of Refrigerant	None:R22 Na:R410A
6	Power Supply	D:1Ph,208/230V,60HZ K:1Ph,220/240V,50HZ M:3Ph,380/415V,50HZ F:3Ph,208/230V,60HZ

3. FUNCTION

Function	Description
Applied Sites	It is applied for all kinds of ships.
Compact design	It can be installed in incapacious place, like the space under the closet and seats of the ship, which affects the outlook of the ship and is coordinate with the ambience.
Rust prevention and rot-proof	Corrosion-resistant material and the special technics- spray coating on the complete unit are adopted, which enable the unit to be durable.
Unique Structure Design	The angle of supplying air of indoor fan can be 0 ° .90 ° .180 ° .270 ° ,which is convenient for connecting duct.
Two Exhaust Outlets	The condensate can be drained in time no matter how ship shakes.

4. PRODUCT DATA

4.1. Product Data at Rated Condition

Models			CYR7/Na-K	CYR9/Na-K
Cooling	Nominal Capacity	W	2100	2600
		Btu/h	7200	8900
	Running Current	A	2.6	3.5
	Power Input	W	580	760
Heating	Nominal Capacity	W	2200	2800
		Btu/h	7500	9500
	Running Current	A	3.1	3.9
	Power Input	W	680	850
Power Supply		—	220-240V~50Hz	
Compressor Type			Rotary	
Refrigerant	Type		R410a	
	Control		Capillary	
	Charge	kg	0.39	0.40
Condenser	Type		Cupronickel Stacked tube	
	Diameter Cupronickel	mm	Φ 16	
Evaporator	Type		Aluminum fin-copper tube	
	Fan Type		Centrifugal fan	
	Air Flow(H/M/L)	CFM	206/176/148	279/235/206
	Tuyere Diameter	mm	Φ 100	Φ 100
Sound Pressure Level		dB(A)	58	
Unit Dimensions		mm	413×380×330/	413×380×330/

(Outline/Package) (H×W×D)		545×500×370	545×500×370
Weight (Net/Gross)	kg	26.5/31.5	29/32.5

Models			CYR12/Na-K	CYR16/Na-K
Cooling	Nominal Capacity	W	3500	4600
		Btu/h	11900	15700
	Running Current	A	4.6	5.8
	Power Input	W	950	1200
Heating	Nominal Capacity	W	3800	4750
		Btu/h	13000	16200
	Running Current	A	5	6.7
	Power Input	W	1100	1400
Power Supply		—	220-240V~50Hz	
Compressor Type			Rotary	
Refrigerant	Type		R410a	
	Control		Capillary	
	Charge	kg	0.51	0.60
Condenser	Type		Cupronickel Stacked tube	
	Diameter Cupronickel	mm	Φ 16	
Evaporator	Type		Aluminum fin-copper tube	
	Fan Type		Centrifugal fan	
	Air Flow(H/M/L)	CFM	325/282/235	395/353/323
	Tuyere Diameter	mm	Φ 125	
Sound Pressure Level		dB(A)	58	
Unit Dimensions (Outline/Package) (H×W×D)		mm	468×380×330/ 554×545×376	494×450×355/ 622×590×400
Weight (Net/Gross)		kg	32.5/38	38/43.5

Note: Fluctuation of the current and voltage can't be beyond $\pm 10\%$

- 1) Test Condition of Nominal Cooling Capacity: Indoor side-dry/wet bulb temp: 27/19.5℃;
Water-in temp: Temp difference is 5℃ and static pressure is 0Pa;
- 2) Test Condition of Nominal Heating Capacity: Indoor side-dry/wet bulb temp: 20/15℃;
Water-in temp: 15℃; Flow is as the test of nominal cooling capacity and static pressure is 0Pa;
- 3) Noise Measurement shall comply with JB/T4330-1999.
- 4) Input power excludes that of user's water pump.
- 5) Specification will change with the revision of the product. Parameter on nameplate of the unit is the standard.

4.2. Operation Range

Model	Water side		Air side
	Leaving Water (°C/°F)	Temperature Difference of Water (°C/°F)	Air on Condenser (°C/°F)
Cooling	25	5	10~40
Heating	15	-	4~25

4.3. Electrical Data

Model	Compressor				Supply Blower Motor
	Power Supply	Qty.	RLA	LRA	
	V, Ph, Hz	—	Each	Each	Each RLA
CYR7/Na-K	220-240V 1Ph~50Hz	1	3.05	12.4	0.64
CYR9/Na-K			4.05	19.6	0.86
CYR12/Na-K			5.55	25.0	0.59
CYR16/Na-K			6.8	32	0.85

Notes:

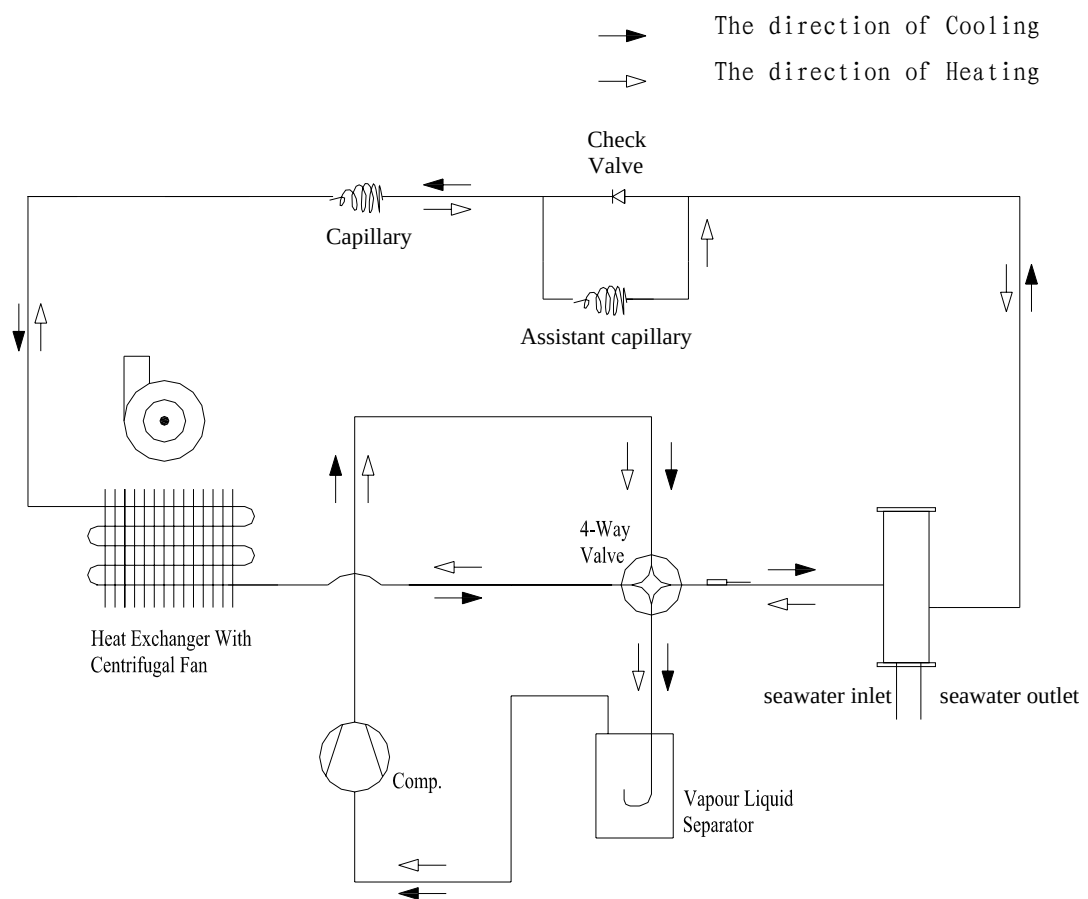
RLA: Rated load amperes

LRA: Locked rotor amperes

5. PIPING DIAGRAM

Name	compressor	4-way valve	Stop Valve	Check Valve	Capillary	Filter	Electronic Expansion Valve
Symbol							
Name	Temperature Sensor	Pressure Switch	Heat Exchanger with Axial Flow Fan	Heat Exchange with Cross Flow Blower	Heat Exchanger with Centrifugal Fan	Thermal Expansion Valve	Vapour Liquid Separator
Symbol							

Heat Pump

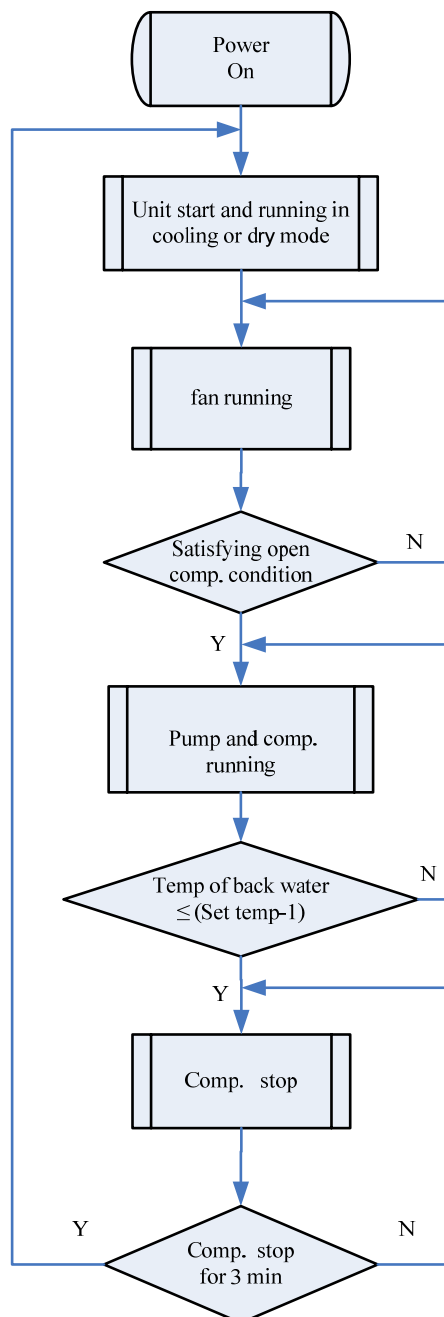


CONTROL

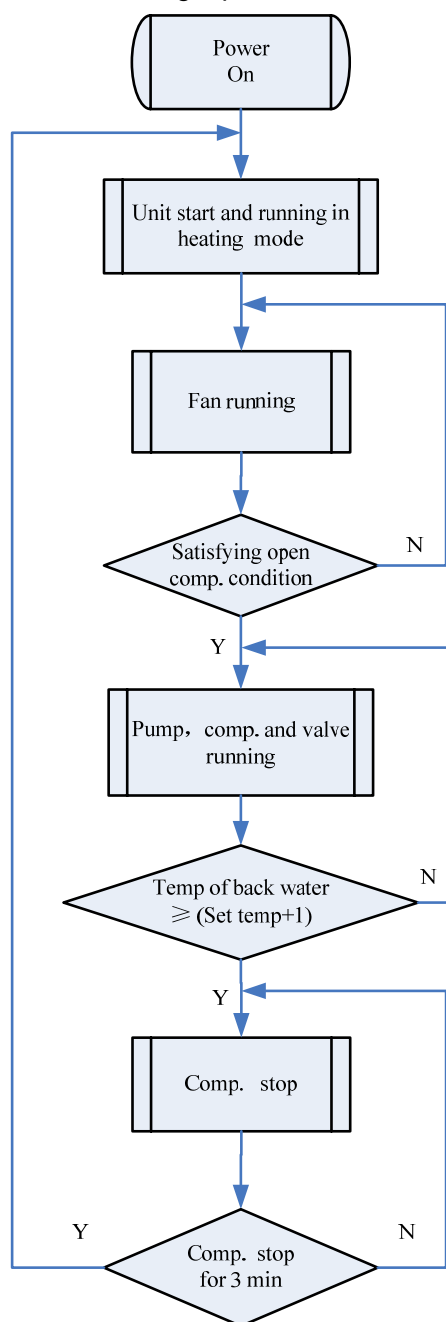
CONTROL

1. OPERATION FLOWCHART

1.1. Cooling/Dry Operation



1.2. Heating Operation



2. MAIN LOGIC

2.1. Cooling/Dry Mode

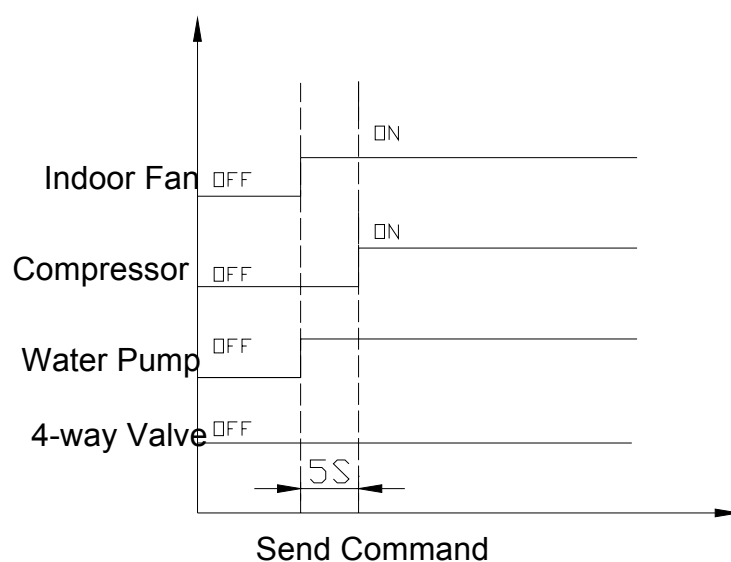
(1) Cooling ON

Condition: Compressor ON: $T_{amb} \geq T_{set} + 1^{\circ}\text{C}$ and no error at the same time. When cooling is entered (they are just conditions for compressor ON, if they can't be met, only indoor fan is running when startup of the unit while water pump and compressor are not running).

Description

- 1) Water pump starts up after the cooling command is sent.
- 2) After indoor fan has been running at high speed for 5s, it turns to low speed.
- 3) Compressor is ON after water pump has started up for 5s
- 4) 4-way valve closes.

Sequence Chart



(2) Betweenness of Cooling

Condition: $T_{\text{set}} - 1^{\circ}\text{C} < T_{\text{amb}} < T_{\text{set}} + 1^{\circ}\text{C}$

Description

- 1) Indoor fan keeps the original status.
- 2) Water pump keeps the original status.
- 3) Compressor keeps the original status.
- 5) Other loads don't need to work,

(3) Cooling OFF

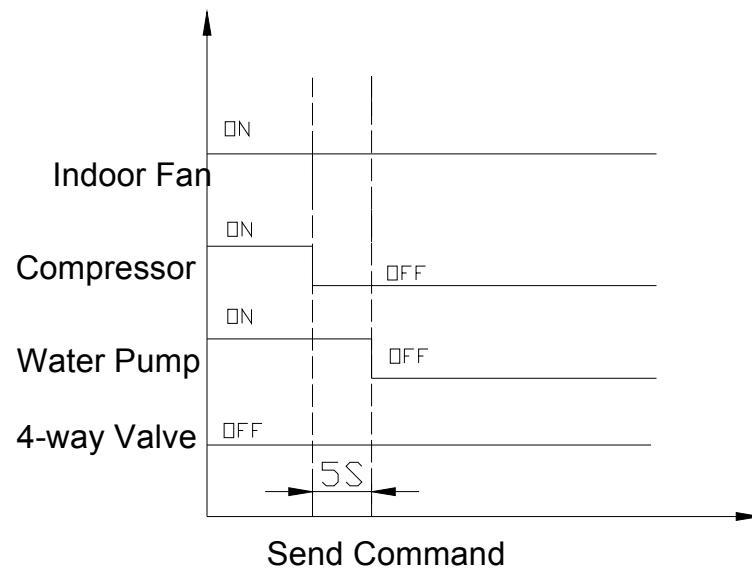
Condition:

$T_{\text{amb}} \leq T_{\text{set}} - 1^{\circ}\text{C}$ and no error at the same time (if there is error, handle it according to troubleshooting sequence).

Description

- 1) Indoor fan is running at setting speed.
- 2) Compressor stops
- 3) Water pump stops after the compressor has stopped for 5s.

Sequence Chart

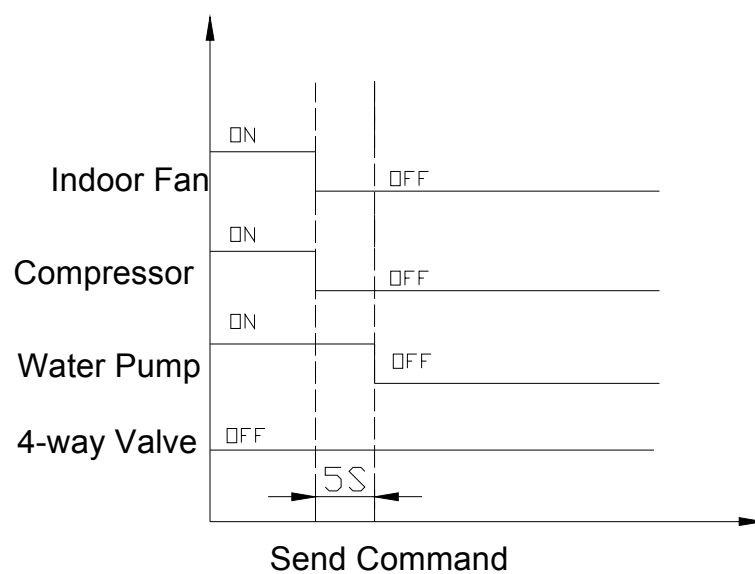


(4) Cooling OFF

Description

- 1) After the command is sent, the compressor stops.
- 2) Indoor unit and indoor fan stop at the same time.
- 3) 5s later water pump stops.

Sequence Chart



2.2. Heating Mode (Defrosting/ Auxiliary Electric Heater)

(1) Heating ON

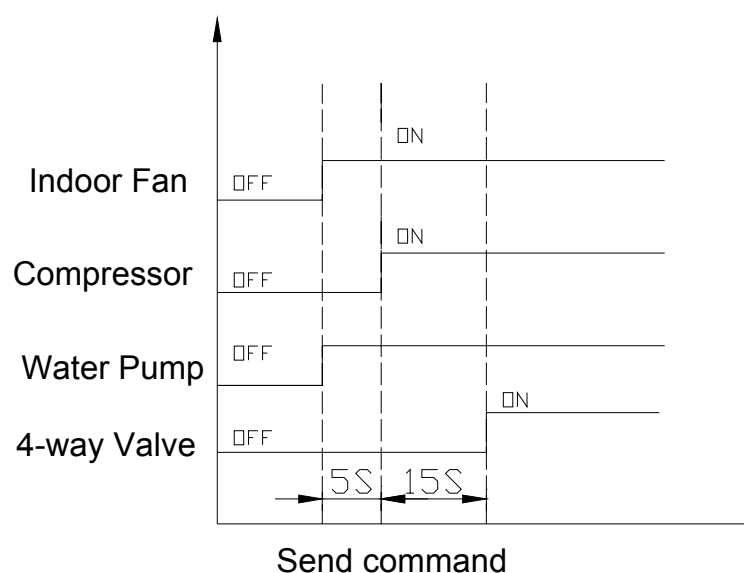
Condition:

Compressor ON: if $T_{amb} \leq T_{set} - 1^{\circ}\text{C}$ and there is no error at the same time, the heating will be entered.

Description

- 1) The indoor unit starts up when the command has been sent.
- 2) Water pump starts up at the same time.
- 3) Compressor starts up when the water pump has started up for 5s.
- 4) When compressor firstly starts up for 15s, 4-way valve is energized.

Sequence Chart



(2) Betweenness of Heating

Condition:

$T_{set} - 1^{\circ}\text{C} < T_{amb} < T_{set} + 1^{\circ}\text{C}$ and no error at the same time((if there is error, handle it according to troubleshooting sequence).

Description

- 1) Indoor fan keeps original status.
- 2) Water pump keeps original status.
- 3) Compressor keeps original status.
- 4) 4-way valve keeps original status.

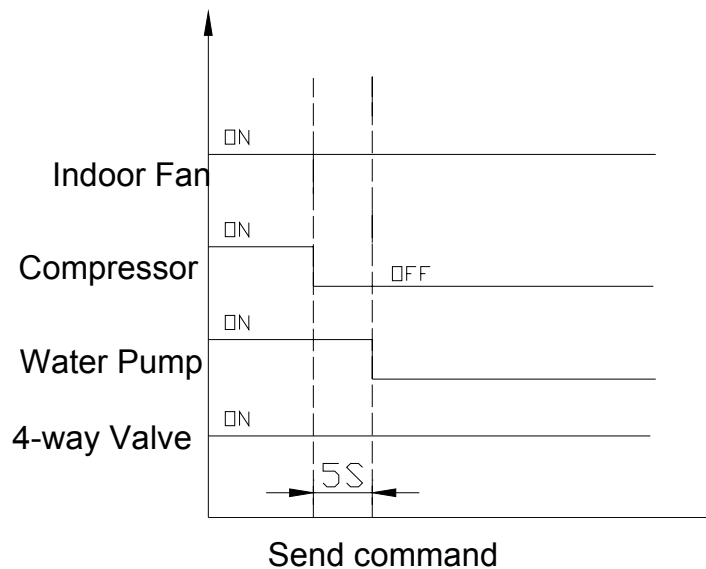
(3) Heating OFF

Condition

$T_{amb} \geq T_{set} + 1^{\circ}\text{C}$ and and no error at the same time((if there is error, handle it according to troubleshooting sequence).

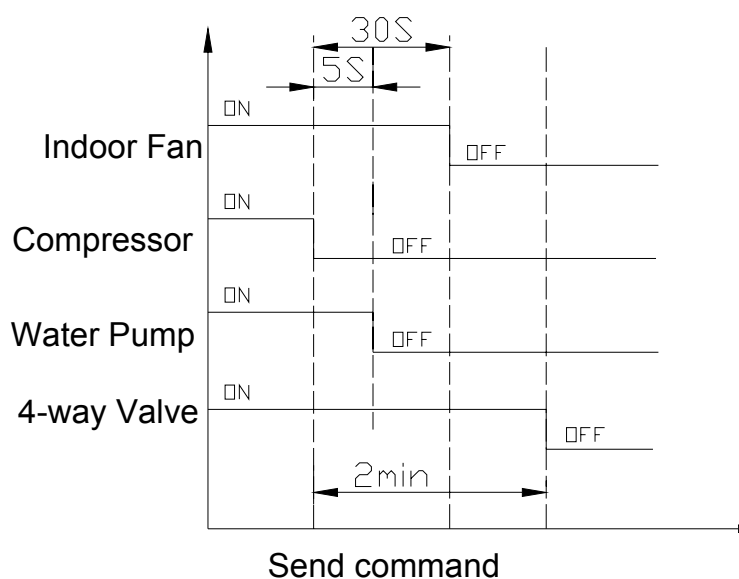
Description

- 1) Indoor fan is running at setting speed.
- 2) Compressor stops.
- 3) 5s later, water pump stops.
- 4) 4-way valve keeps being energized.

Sequence Chart**(4) Heating OFF****Description**

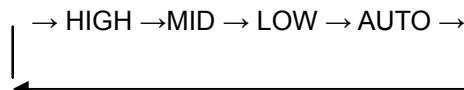
- 1) Compressor stops after command is sent.
- 2) 5s later, water pump stops.
- 3) 30s later after the stop of compressor, indoor fan stops.
- 4) 4-way valve is deenergized after the compressor has stopped for 2min.

Sequence Chart



2.3. Fan Mode

Indoor fan is running at setting speed and there are three options for the speed.



Auto Air Speed

a) Heating

If $T_{amb} \geq T_{set}$, it is automatically set to be low speed.

If $T_{set} - 2^{\circ}\text{C} < T_{amb} < T_{set}$, it is automatically set to be mediate speed.

If $T_{amb} \leq T_{set} - 2^{\circ}\text{C}$, it is automatically set to be high speed.

During this course, there must be 30s delay at least.

b) Cooling

If $T_{amb} \leq T_{set}^{\circ}\text{C}$, it is automatically set to be low speed.

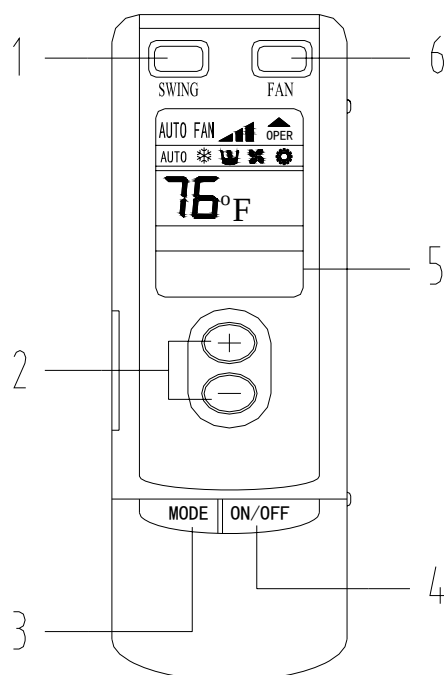
If $T_{set} < T_{amb} < T_{set} + 3^{\circ}\text{C}$ it is automatically set to be mediate speed.

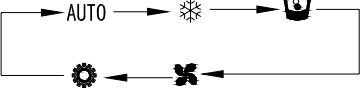
If $T_{amb} \geq T_{set} + 3^{\circ}\text{C}$ it is automatically set to be high speed.

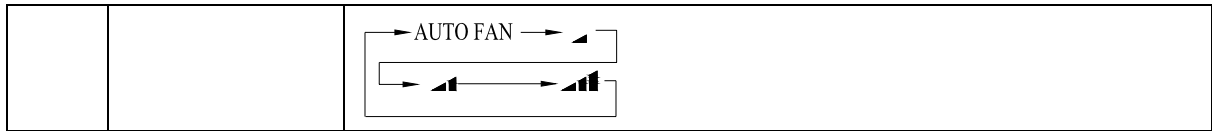
3. REMOTE CONTROLLER

3.1. Wireless Remote Controller

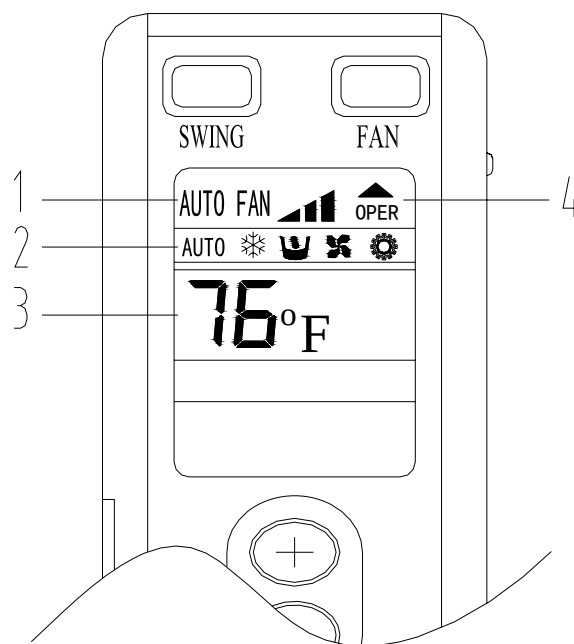
3.1.1 Operation View



NO.	Name	Function description
1	SWING button	There is no swing function in this A/C unit.
2	TEMP button	TEMP. increase 1° by pressing $\oplus$ button once, and decreases 1° by pressing $\ominus$ button once. COOL MODE SET Temp. 61° F-86° F or 16° C-30° C HEAT MODE SET Temp. 61° F-86° F or 16° C-30° C DEHUMIDIFY MODE 61° F-86° F or 16° C-30° C
3	MODE button	Press this button to change the operation mode in order of  Note: the cooling only without  mode.
4	ON/OFF button	Press this button to turn on or turn off the unit.
5	LCD	It shows all the setting contents. Note: Cover remove will not change the display contents.
6	FAN button	Press this button to change the fan speed:



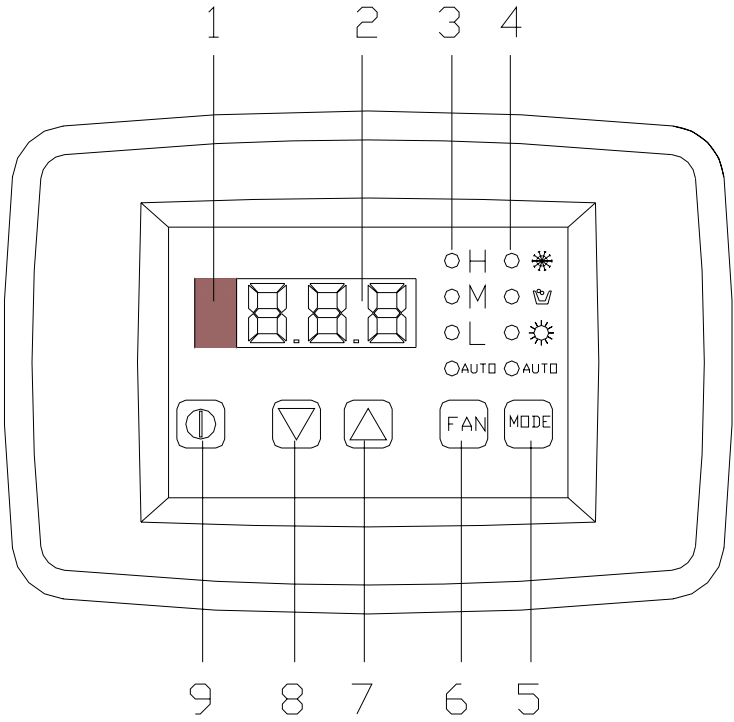
3.1.2 Display View



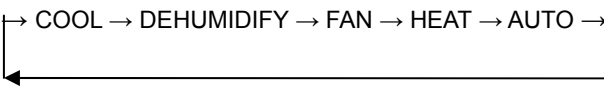
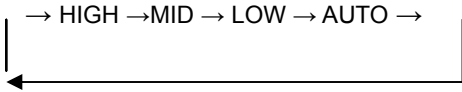
NO.	Display	Function description
1	Fan speed display	HIGH-MID-LOW and AUTO speed
2	Display of mode operation	AUTO : Run automatically; ❄️ : Cooling; 🏠 : Dry; 🌀 : Only fan run; ⚙️ : Heating Cooling only type without heat mode
3	Digital display	Display of set temperature
4	Display of ON/OFF	/

3.2. Wired Remote Controller

3.2.1 Operation View



NO.	Name	Function description
-----	------	----------------------

1	Remote receiver	Receive the signal from the mainboard
2	Digital display	Display of set temperature
3	Fan speed display	Display of HIGH-MID-LOW or AUTO speed
4	Display of mode operation (COOL-DEHUMIDIFY-HEAT and AUTO)	In "COOL" mode, the LED marked  will be light if the set temperature is lower than room temperature. If set temperature is higher than room temperature, only the fan will run. In "DEHUMIDIFY" mode, the LED marked  will be light and fan will work at low speed within a certain temperature range. Dehumidifying is more efficient than in cooling mode and it will save energy. In "HEAT" mode, the LED marked  will be light when the set temperature is higher than the room temperature. When the setting temperature is lower than the room temperature, it will not run. In "FAN" mode, the room temperature will be displayed and the temperature cannot be set. In "AUTO" mode, the LED marked AUTO will be light and the room temperature will be displayed. The temperature cannot be set, as the system will run automatically in the appropriate mode according to the contrast between room temperature and set temperature.
5	Mode button	Press this key to change the operation mode in order of 
6	Fan control button	Press the FAN button, the fan speed will change in the following order:  In "DEHUMIDIFY" mode, the fan will work at low speed automatically.
7	Temp. Setting button (Increasing)	To increase in 1° increments
8	Temp. Setting button (Decreasing)	To decrease in 1° increments
9	ON/OFF button	Press ON/OFF button to turn the unit on Pressing the ON/OFF button a second time will turn the unit off

3.3. Display Fahrenheit or Centigrade

Pressing the ▲ and ▼ key simultaneously, will switch between Fahrenheit and Centigrade modes.

3.4. Key Lock

- Press ▼ and FAN key simultaneously, all keys are locked. Press ▼ and FAN key simultaneously again, to unlock the keys.
- When keys are locked, the controller is locked out of system operation. "EE" will be displayed.

3.5. Starting Interval Setting

- If there are several A/C units in a yacht, you can set starting time interval between one by one.
- When the manual controller power on, and there isn't any operation, to press
- the ▲ button and fan speed button simultaneously, the starting interval can be set, the nixie tube will flash a number in every 0.5s, then pressing ▼ and ▲ buttons to set up, after the setting, to press the ▲ button and fan speed button simultaneously, to confirm the set up value; if not to press ▲ button and fan button again simultaneously, the figure will flash 10s, and then the controller will quit from starting interval setting, the setting number is not available.
- The value be displayed by nixie tube is the figure of interval time, each interval time is 20s, for example the set up value is 128, it means that the actual setting interval time should be $128 \times 20 = 2560s$.
- When the value be displayed by flashing nixie tube, then to shield each signal of wireless remote controller, excepting to press the ▲ button and fan speed button at the same time, and to shield other buttons.
- After manual controller powered on, if there is wireless remote controller or at the same time to press other buttons except the ▲ button and fan speed button simultaneously, and then press the ▲ button and fan speed button simultaneously, it will display the figure of interval time for 5s. During the period, if there is wireless remote controller or other remote controller signal, it will directly quit the display interface of starting interval time.
- The new setting starting interval time would be executed after manual controller re-powered on.
- The setting range of starting interval value is 0-255; accordingly, the setting range of starting interval time is 0-5100s(85min).
- If there is malfunction happened, cannot set up or display the time of starting interval.

3.6. Auto –off function of the manual controller

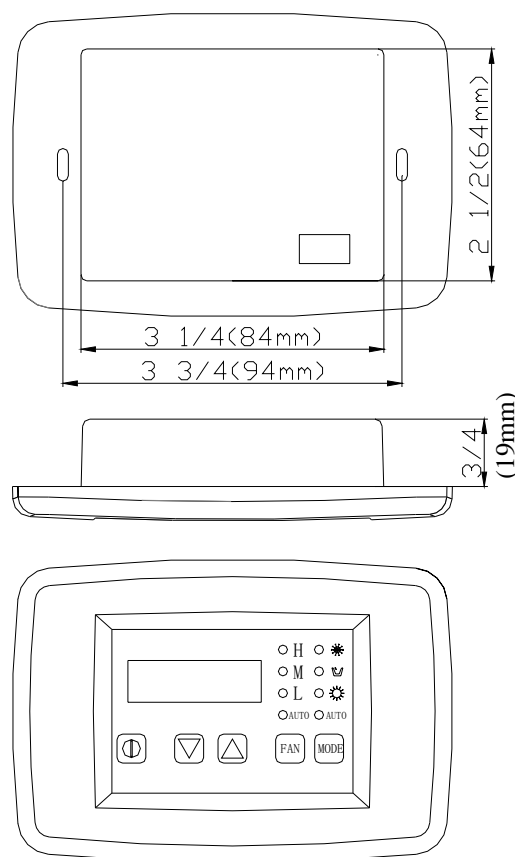
The display of ambient temperature will automatically blank in 5-minute lag if there is no operation on the manual controller.

(1) After receiving the signal from the manual controller, the indicator will light on automatically, in which case, the unit will not operation at all and the manual controller can be active after it lights on.

(2) After receiving the signal from remote controller, the display of temperature on the manual controller will light on; meanwhile, the unit carries out corresponding operation.

- After the unit stops, there is no display on the manual controller.
- Powered on again if the unit status is on before power off, temperature indicator and mode indicator of the manual controller will light on automatically.
- If the unit receives the stop signal, it will directly blank off the temperature indicator and mode indicator of the manual controller.

3.7. Dimension



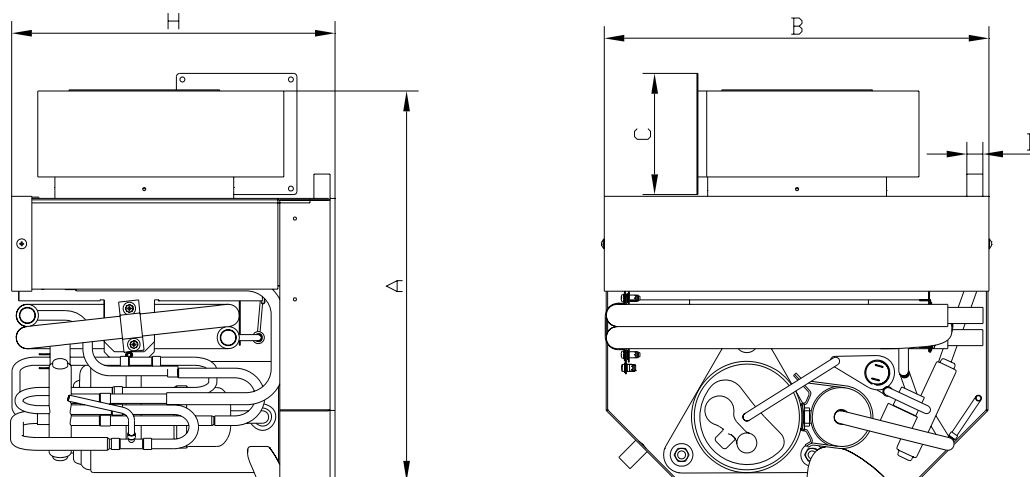
3.8. Installation

Before mounting the manual controller, consider the location. The manual controller should be mounted on an inside wall, slightly higher than mid-height of the cabin. The cut out size for the manual controller is 2 1/2" (64mm) wide by 3 5/16" (84mm). Do not mount the manual controller in direct sunlight, near any heat producing appliances or in a bulkhead where temperatures radiating from behind the panel may affect performance. Do not mount the manual controller in the supply air stream. Do not mount the manual controller above or below a supply or return air grille. Do not mount the manual controller behind a door, in a corner, under a stairwell or any place where there is no freely circulating air. Mount the manual controller within display cable length (custom lengths available) of the air conditioner. Plug the display cable into the circuit board in the electric box and into the back of the manual controller.

INSTALLATION

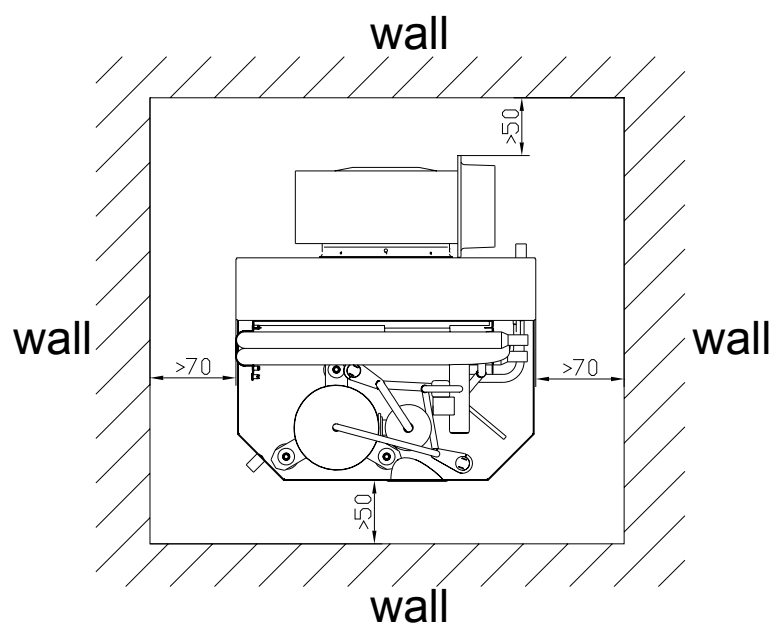
INSTALLATION

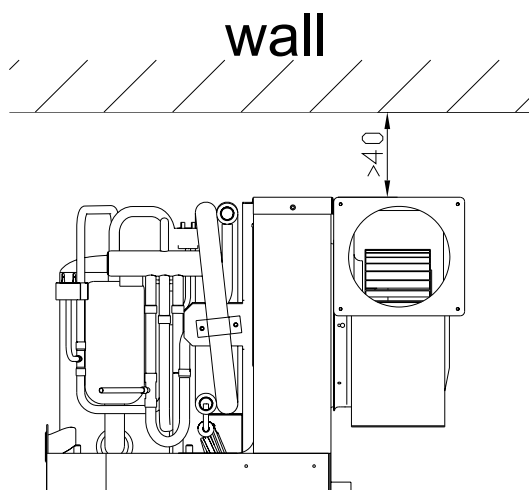
1. Dimension Data



Model	H	A	B	C	D
CYR7/Na-K	331	386	383	120	16
CYR9/Na-K	331	395	383	120	16
CYR12/Na-K	331	441	383	150	16
CYR16/Na-K	358	475	455	150	16

2. Installation Clearance Data





Note: Air outlets on bottom and both sides shall be away from the ceiling for 40mm at least; Air outlet shall be away from the ceiling for 100mm at least.

Drain Piping Work

The condensate drain pan is 2" (50mm) high with two drain locations. During conditions of high humidity, condensate may be produced at a rate of approximately 1/2 gallon per hour (1.9 liters per hour). Please pay more attention, it is important to route condensate drains downward to a sump pump. It is not recommended to route condensate drains to the bilge. After the condensate drain installation is complete, test the installation by pouring water into the pan and checking for good flow.

For installation of the condensate drain:

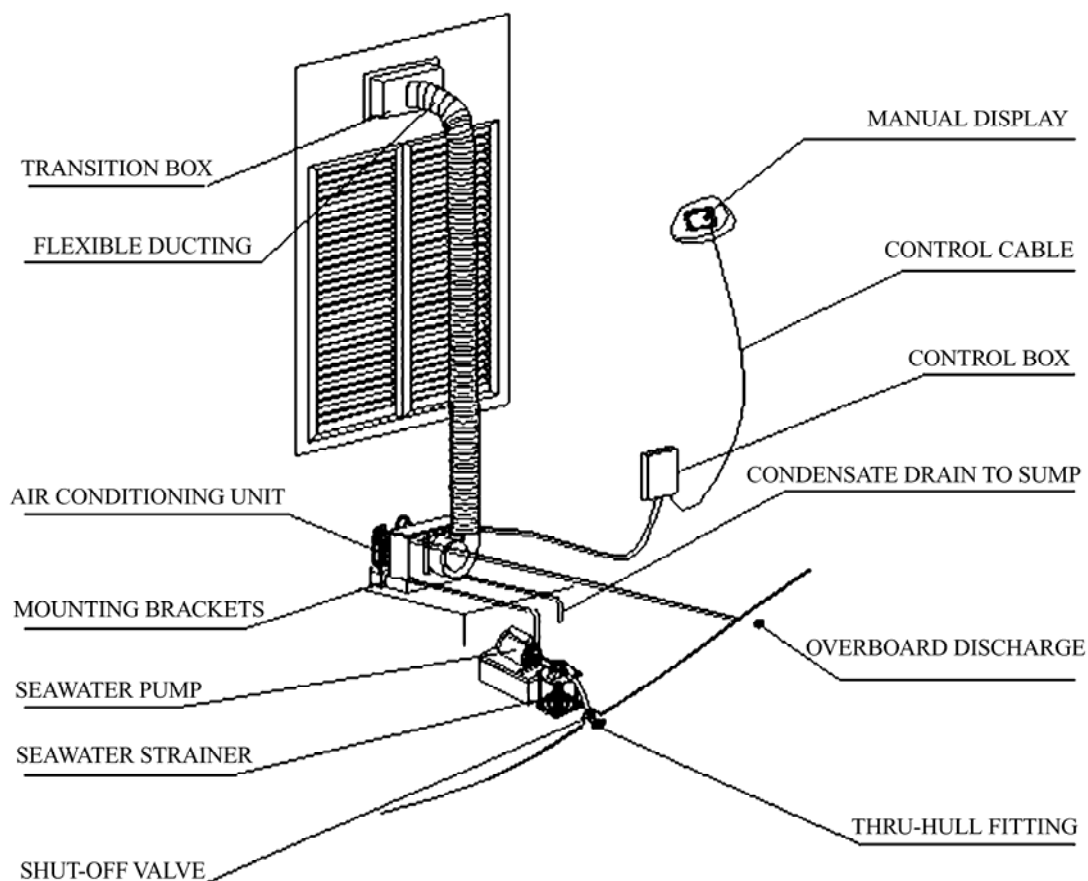
- Attach a 5/8" I.D. reinforced hose to the hose barb and secure with stainless steel hose clamps.
- Install the condensate drain hose downhill from the unit and aft to a sump.
- Two drain fittings may be used and the hoses (teed) together using a tee fitting provided there is a minimum 2" drop from the bottom of the base pan to the tee connection.



Do not terminate condensate drain line within three 3' (914mm) of any outlet of engine, generator exhaust systems, compartment housing an engine or generator, nor in a bilge, unless the drain is connected properly to a sealed condensate or shower sump pump. Seal all condensate hose penetrations.

3. Unit Installation

Selecting a good location for your air conditioner is the most important part of your preparation. Be sure to consider the size of the area you are cooling, the air distribution needs, and the size of the unit you have chosen. Keeping in mind that cool air has a tendency to fall; it is highly recommended that you locate the supply air grille as high as possible in the cabin. See diagram below.



The unit should be installed as low as possible, **BUT NEVER IN THE BILGE OR ENGINE ROOM AREAS, ENSURE THAT THE SELECTED LOCATION IS SEALED FROM DIRECT ACCESS TO BILGE AND/OR ENGINE ROOM VAPORS.** Installing the unit as low as possible (such as under a V-berth, dinette seat or bottom of a locker) and ducting the supply air as high as possible, creates an ideal airflow condition. This type of installation will prevent short or premature cycling.

The unit should be positioned on a firm, level, horizontal surface and the condensate drain line should run downward from the unit to a suitable drain location. Plan all Connections, which must be made including ducting, condensate drain, and seawater in and out, electrical power connections, location of control, and seawater pump placement, to assure easy access for routing and servicing.

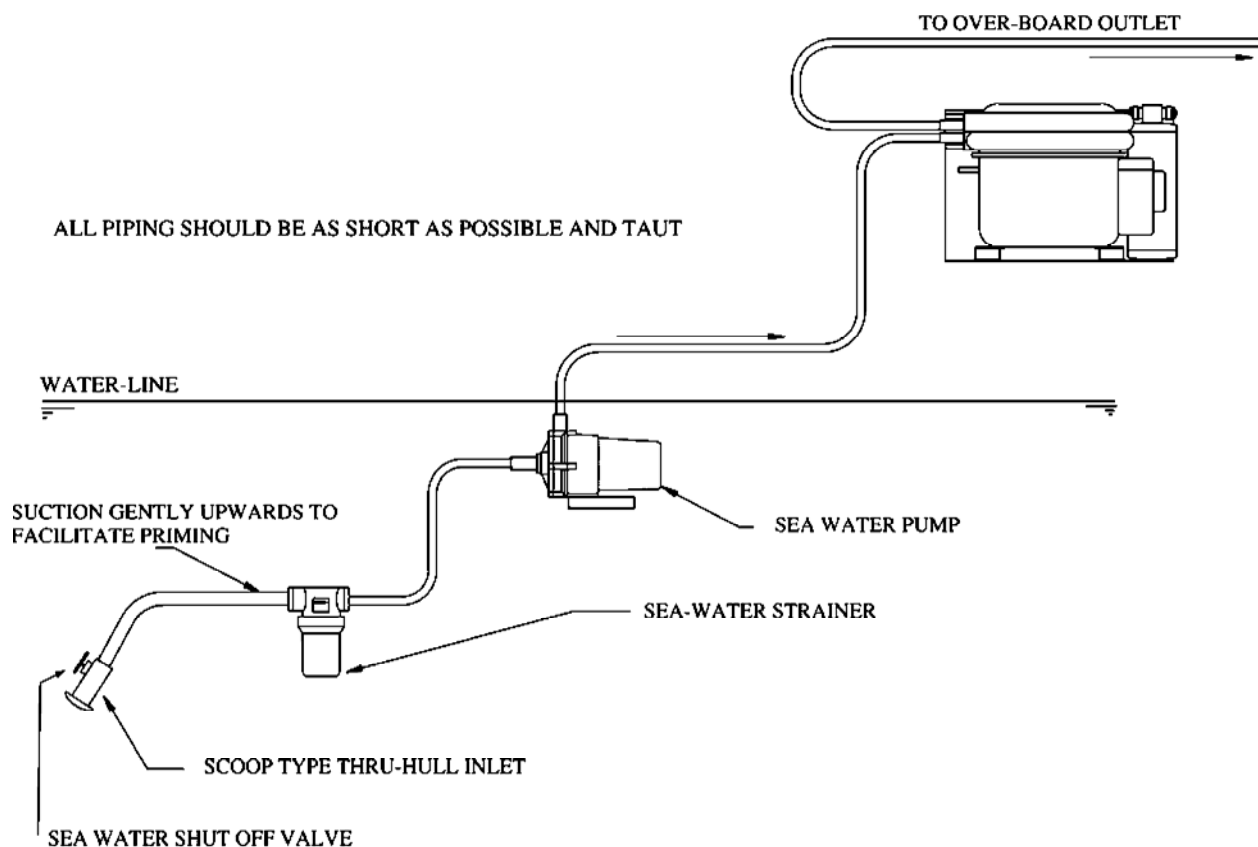
4. Water System Installation

Several guidelines should be followed during the installation of the seawater system. Since the circulation pump is centrifugal and not self-priming, it must be mounted so that it is always at least 1' (305mm) below the water line regardless of which tack the vessel is on. Pump may be mounted horizontally or vertically, however, the discharge must always be above the inlet. Pump head should be rotated toward the direction of water flow. Install the seawater speed scoop intake as far below the water line and as close to the keel as possible in any application,

but especially on a sailboat, to keep the intake in the water when the boat heels over so that air does not get into the system. The speed scoop intake must face forward and not be shared with any other pump. A seawater strainer is mandatory between the shut off valve (seacock) and the pump to protect the pump from any foreign matter. Failure to install a seawater strainer will void the pump warranty. The seawater system should be installed with an upward incline from the speed scoop & seacock, through the strainer, to the inlet of the pump, next to the inlet of the a/c unit's condenser coil. The discharge from the a/c unit should run to the seawater outlet thru-hull fitting that should be located where it can be visually inspected for water flow as close to the waterline to reduce noise. All hose connections shall be secured using double/reversed stainless steel hose clamps. Use Teflon tape on all threaded connections.

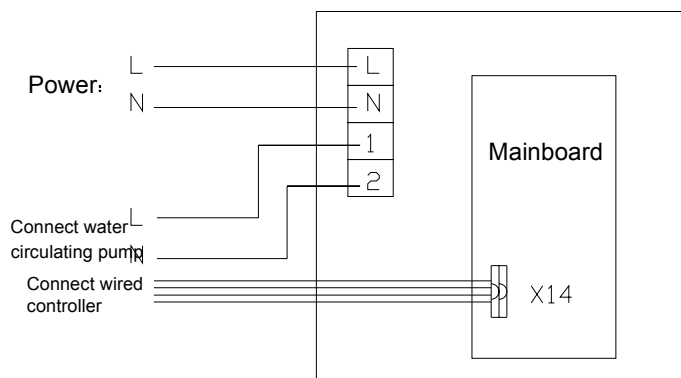
Summary of the seawater system installation:

1. Install the speed scoop thru-hull inlet as close to the keel and as far below the water line as possible, facing forward. Bed the scoop with a marine sealant designed for underwater use.
2. Install a bronze, full flow seacock on the speed scoop thru-hull inlet.
3. Install a seawater strainer below the level of the pump with access to filter.
4. Mount the pump above the strainer and at least 1' (305mm) below the waterline.
5. Connect the seacock and strainer with an uphill run of 5/8" reinforced marine grade hose.
6. Connect the discharge from the pump uphill to the bottom inlet of the a/c unit's condenser coil with 5/8" hose. Connect the discharge from the condenser coil to the overboard discharge thru-hull fitting with 5/8" hose.
7. Avoid loops, high spots or the use of 90° elbows with seawater hose (each 90° elbow is equivalent to 2.5' (762mm) of hose and a 90° elbow on the pump outlet is equivalent to 20' (6.1m) of hose).
8. Double clamp all hose connections with stainless steel clamps, reversing the clamps.
9. Use Teflon tape on all threaded connections.
10. Connect all metallic parts in contact with seawater to the vessel's bonding system including the speed scoop inlet, strainer, pump and the air conditioner. Failure to do so will void warranty.



5. ELECTRIC WIRING WORK

5.1. Electric Wiring Design



5.2. Specification of Power Supply Wire and Air Switch

Model	Power Supply	Capability of	Minimum	Minimum Sectional
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		Air Switch	Sectional Area of Earth Wire	Area of Power Supply Wire
	V Ph Hz	(A)	(mm ²)	(mm ²)
CYR7/Na-K	220-240V 1Ph 50Hz	6	1. 0	1. 0
CYR9/Na-K		6	1. 0	1. 0
CYR12/Na-K		10	1. 5	1. 5
CYR16/Na-K		10	1. 5	1. 5

MAINTENANCE

MAINTENANCE

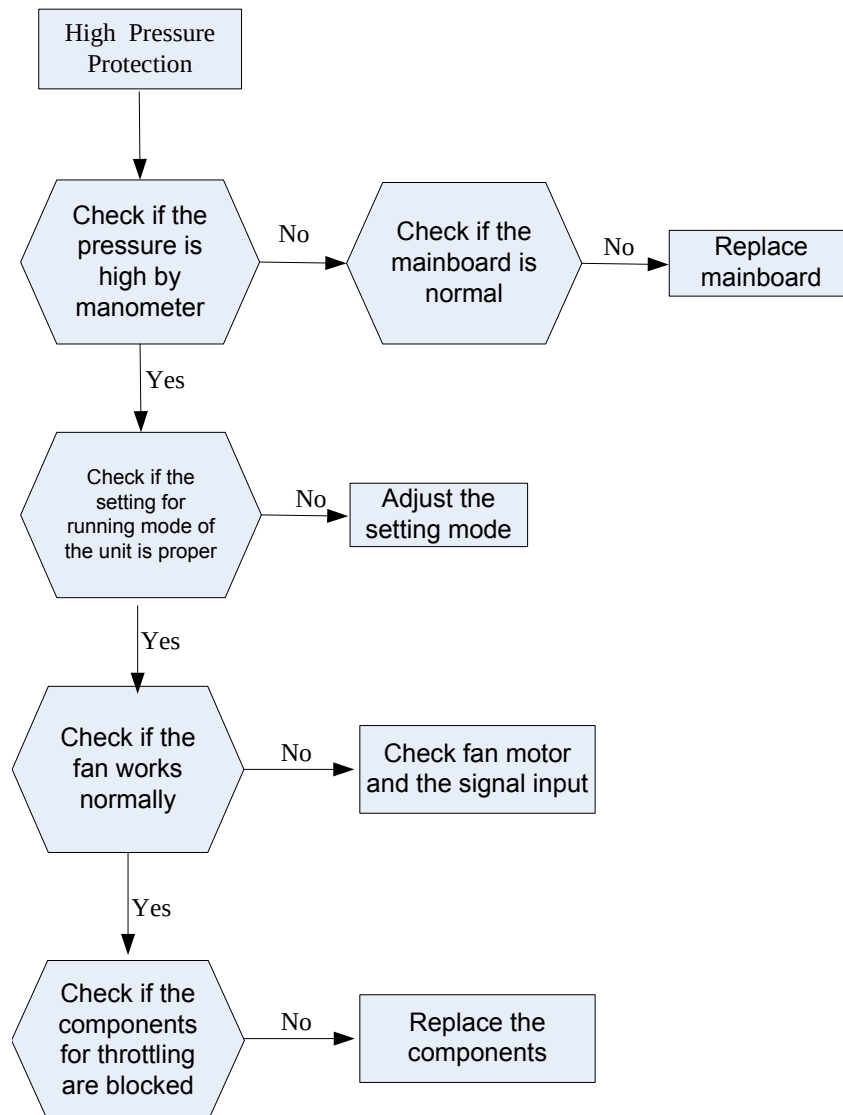
1. TROUBLE TABLE

Trouble Code	Trouble Name	Origin of Trouble Signal	Control Description
E1	High Pressure Protection of Compressor	High Pressure Switch	When high pressure is detected for continuous 3s, turn off the system(4 way-valve is excluded when heating), and “E1” will be displayed. It cannot be recovered. “E1” is cleared by pressing button “ON/OFF”. Press ON/OFF again to resume running.
E2	Indoor Antifreezing Protection	Temp Sensor	Under Cool or Dry mode, after the compressor has been running for continuous 15min, if Teva <-2℃ is detected for continuous 3min, compressor will stop, fan will keep original status, nixie display indicator will display “E2”. When Teva ≥10℃ for continuous 1s, it will recover and system will work normally.
E3	Low Pressure Protection of Compressor	Low Pressure Switch	After 4min startup of compressor, detection for low pressure is executed. When detect that the low pressure switch breaks for 30s, the system is turned off (4-way valve is excluded when heating and indoor fan stops after the compressor has stopped for 30s.), E3 is displayed and buzzer is warning. It can't recover automatically. Press ON/OFF to clear the warning of voice.
E6	Communication Error Protection		When communication error has been detected for 1min, system is turned off 94-way valve is excluded when heating and indoor fan stops after the compressor has stopped for 30s.)and E6 is displayed. After the communication turns to normal, system resumes running and error code is cleared.
F0	Indoor Ambient Temp Sensor Error	Temp Sensor	When detect that AD value is greater than 250 (short circuit) or less than 5 (open circuit) for continuous 5s, it is believed that the temp sensor is error. If detect that the

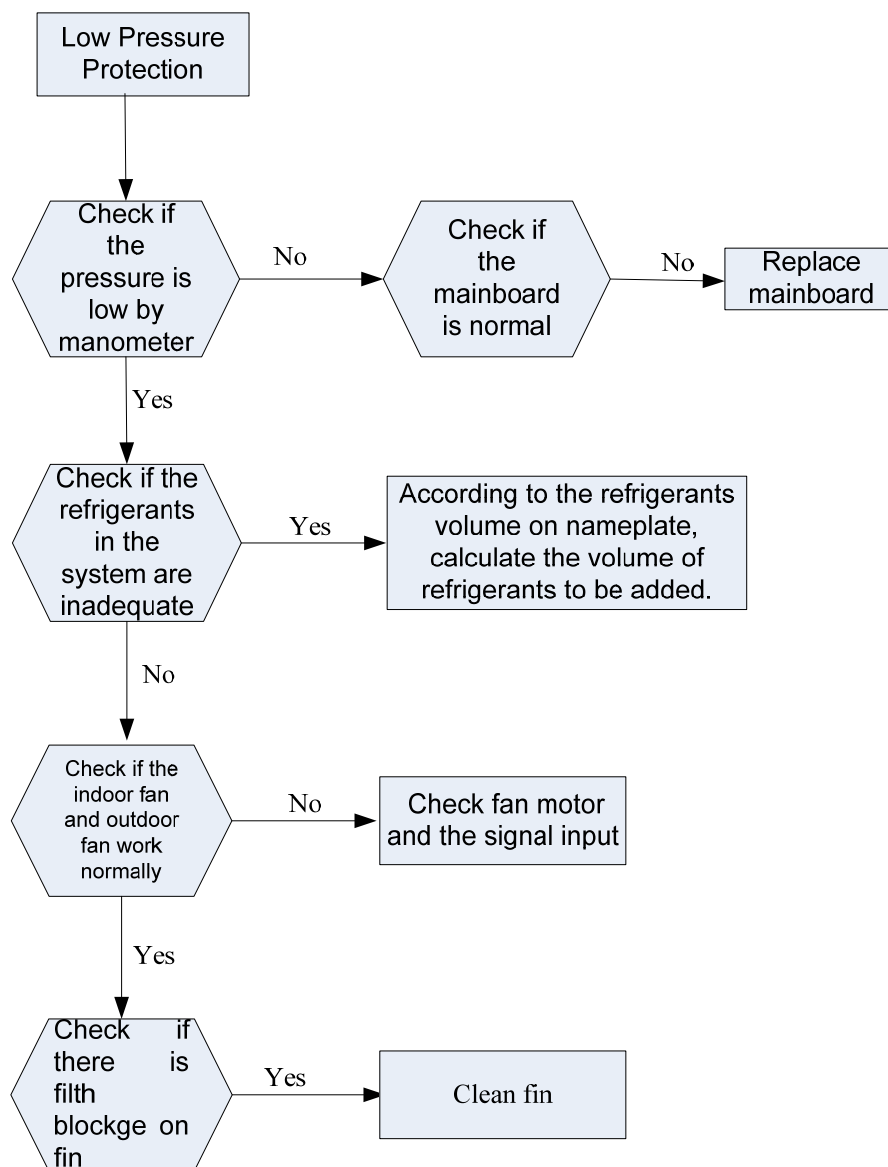
			AD value is between 5 and 250 for continuous 5s, it is believed that the temp sensor recovers. When there is error of temp sensor, system is turned off (4-way valve is excluded when heating and indoor fan stops after the compressor has stopped for 30s) and F0 is displayed. It can resume running when the error is cleared. Under air supply mode, only error code is displayed and the fan works normally. The error code will disappear when the error is cleared.
F1	Evaporator Temp Sensor Error	Temp Sensor	When detect that AD value is greater than 250 (short circuit) or less than 5 (open circuit) for continuous 5s, it is believed that the temp sensor is error. If detect that the AD value is between 5 and 250 for continuous 5s, it is believed that the temp sensor recovers When there is error of temp sensor, the system is turned off (4-way valve is excluded when heating and indoor fan stops after the compressor has stopped for 30s.) and F1 is displayed. After the error is cleared, it resumes running. Under air supply mode, only error code is displayed and fan works normally. When error is cleared, error code will disappear.

2. FLOW CHART OF TROUBLESHOOTING

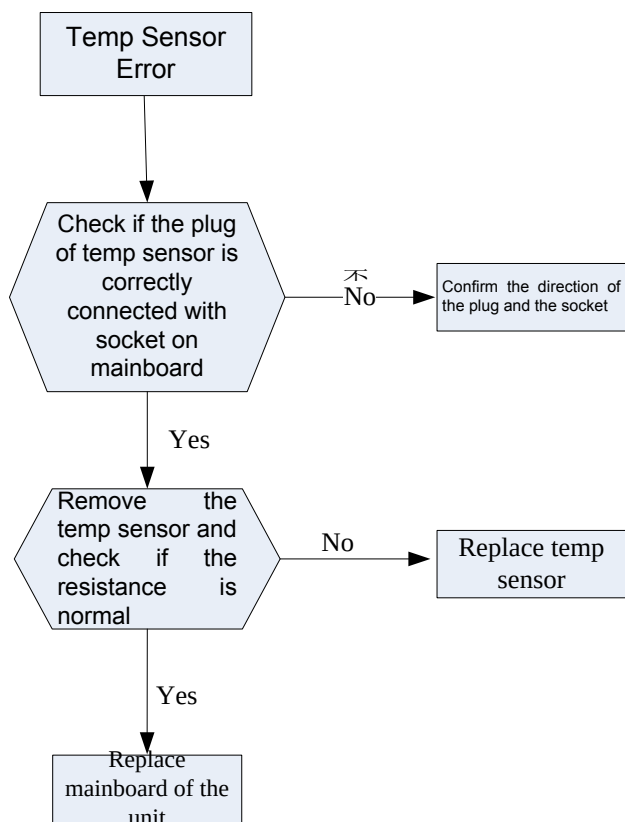
2.1. High Pressure Protection



2.2. Low Pressure Protection

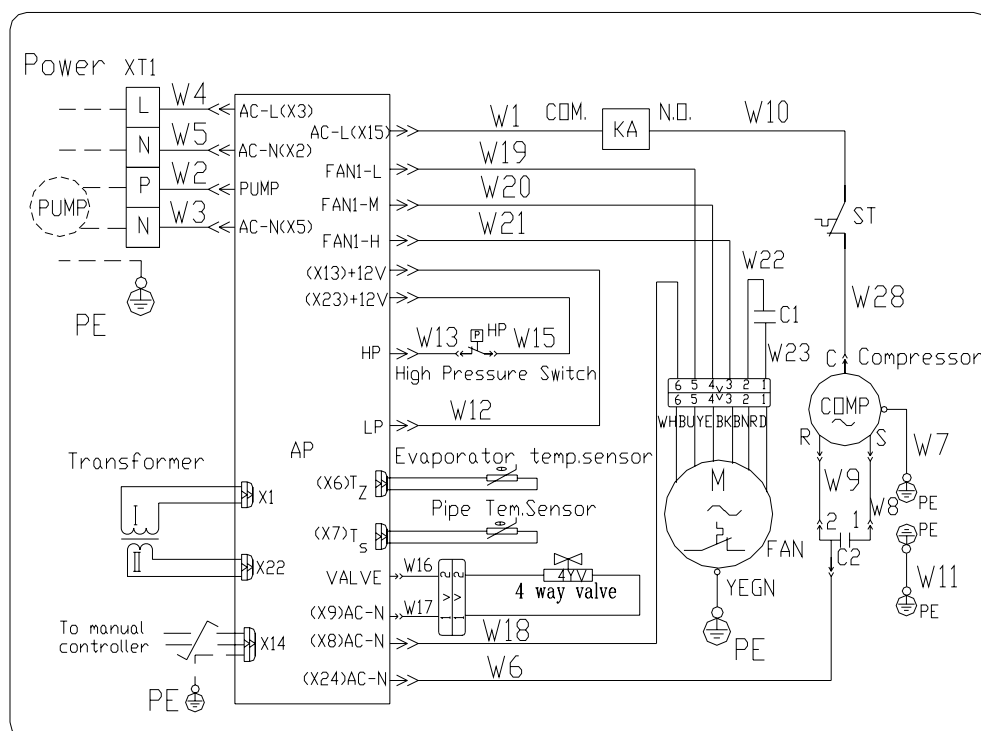


2.3. Temp Sensor Error

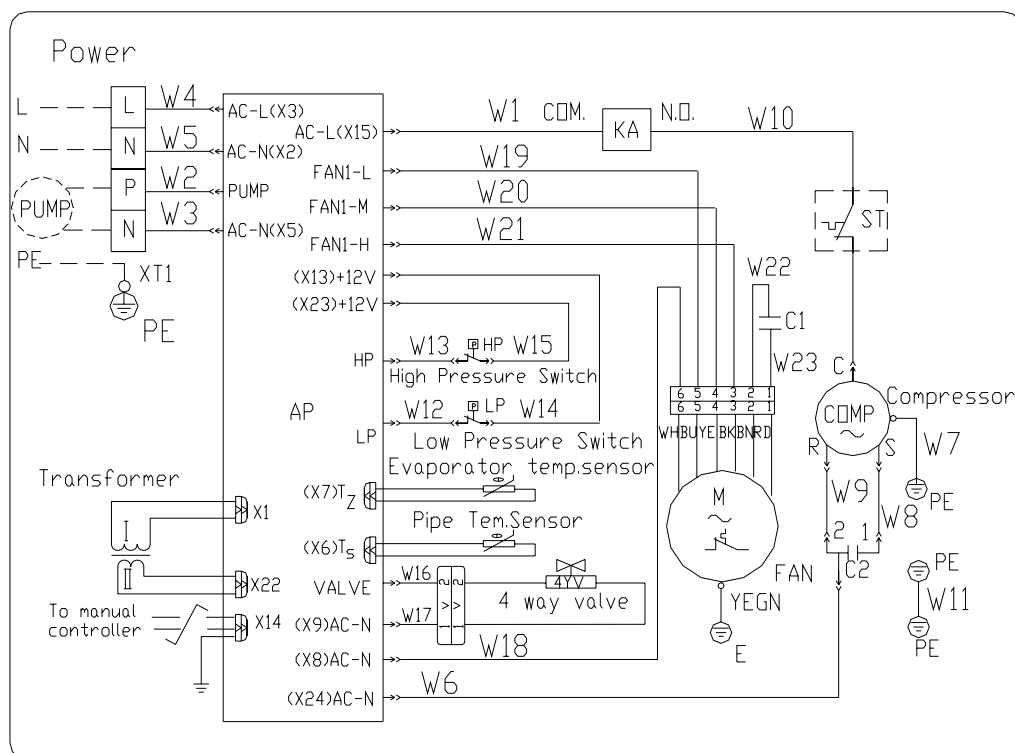


3. WIRING DIAGRAM

WIRING DIAGRAM CYR7/Na-K.CYR9/Na-K

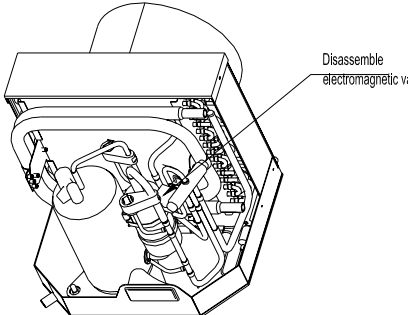
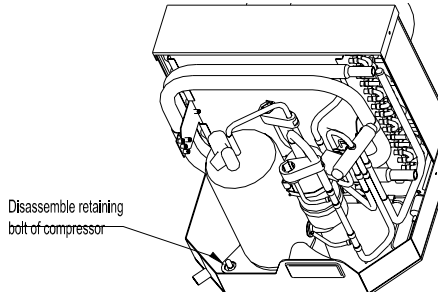
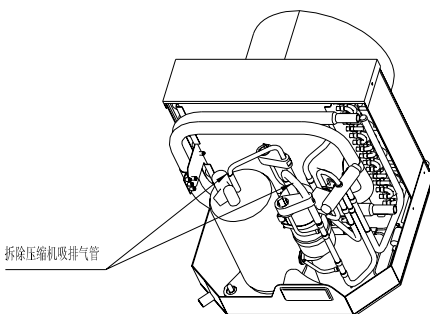
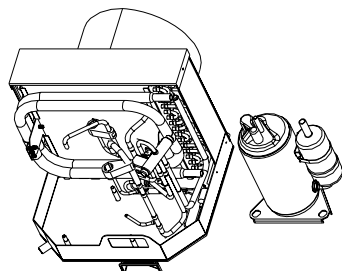


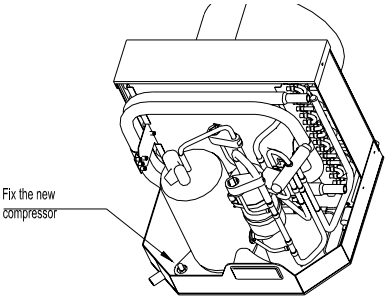
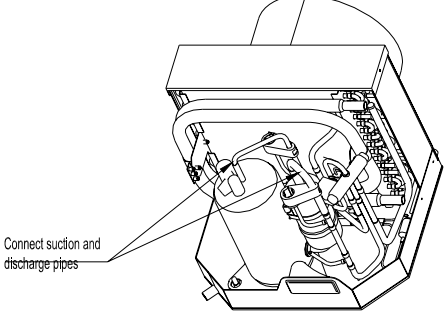
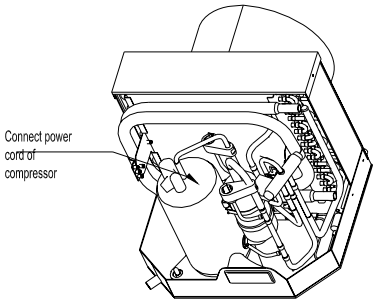
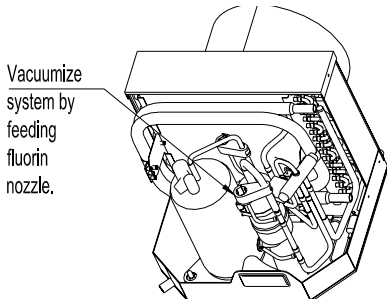
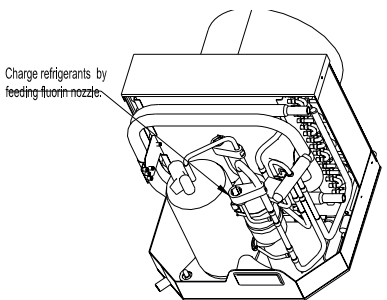
WIRIN GDIAGRAM CYR12/Na-K.CYR16/Na-K



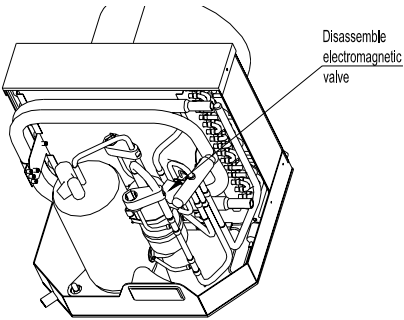
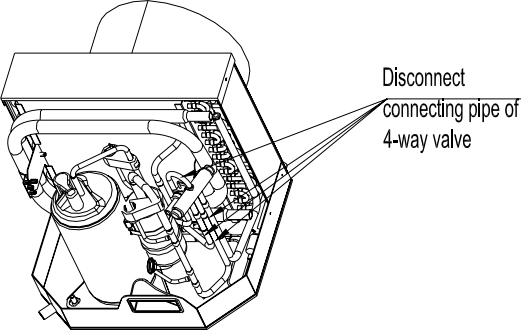
4. DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS

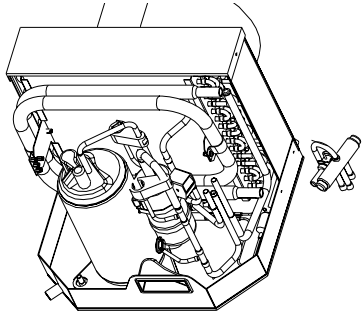
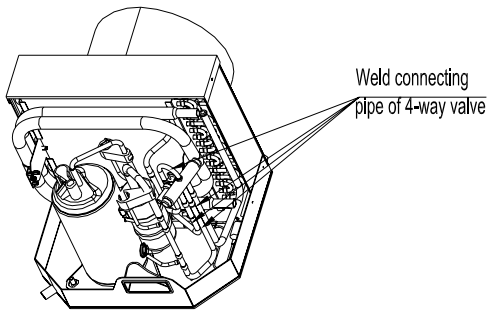
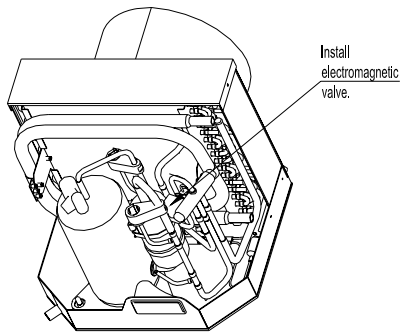
4.1.Compressor

Disassembly and Assembly of Compressor		
Remark : Make sure that there isn't any refrigerant in pipe system and the power supply is cut off before removal of the compressor.		
Process	Pictorial View	Handling Description
1 . Disconnect the power cord	 Disassemble electromagnetic v.	●Unscrew the retaining screw of power cord with screwdriver. ●Unplug the power cord.
2. Disassemble retaining nut	 Disassemble retaining bolt of compressor	●Unscrew retaining nut by screwdriver.
3. Disassemble the discharge pipe and the suction and discharge pipe of compressor.	 拆除压缩机吸气管	●Heating suction and discharge pipe by acetylene welding and then unplug them from compressor. ●Conduct nitrogen-fill protection on process pipe and the pressure of nitrogen is $0.5 \pm 0.1 \text{ kgf/cm}^2$ (relative pressure). ●Heat it with caution in case the surroundings get burnt due to high temperature
4 . Remove compressor		● Remove the compressor from chassis.

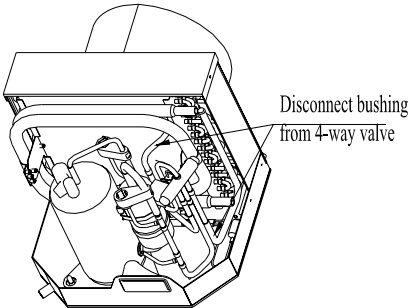
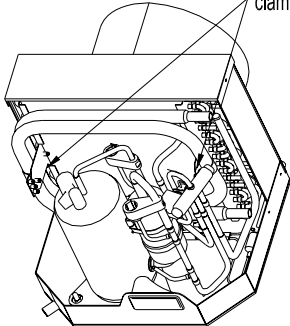
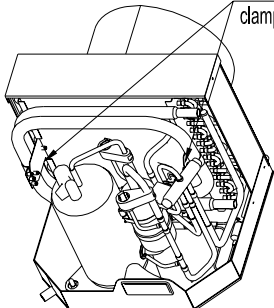
5. Fix the new compressor on chassis.		●Place the new compressor on the accurate position ●Screw up retaining bolts of compressor ●Don't inversely place the compressor
6. Connect the inlet and outlet of compressor with pipeline of system.		●Weld suction and discharge pipe by acetylene welding ●Conduct nitrogen-fill protection on process pipe and the pressure of nitrogen is $0.5 \pm 0.1 \text{ kgf/cm}^2$ (relative pressure). ●Heat it with caution in case the surroundings get burnt due to high temperature
7 . Connect power cord of compressor		●Connect the power cord to retaining bolts according to disassembly sequence. ●Screw the bolts tightly.
8 . Vacuumize system by feeding fluorin nozzle.		●Vacuumize system by feeding fluorin nozzle. ●
9 . Charge refrigerants again by feeding fluorin nozzle.		●Charge refrigerants again by feeding fluorin nozzle. ●Charge volume must comply with the nameplate.

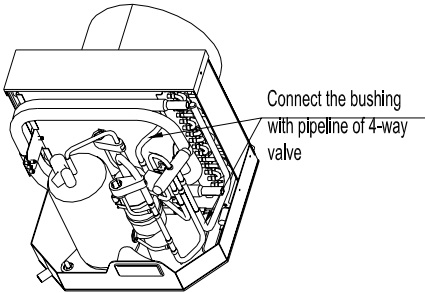
4.2. The 4-way valve

Disassembly and Assembly of the 4-way valve		
Remark : Make sure that there isn't any refrigerant in pipe system and the power supply is cut off before removal of the thermal expansion valve.		
Process	Pictorial View	Handling Description
1. Disassemble electromagnetic valve.		●Dismantle electromagnetic valve with spanner. ●Remove electromagnetic valve from 4-way valve.
2. Dismantle 4-way valve.		●Heat connecting pipe of 4 vents of 4-way valve by gas welding and then unplug 4-way valve. ●nitrogen-fill protection shall be conducted on welding joint and the pressure of nitrogen is $0.5 \pm 0.1 \text{ kgf/cm}^2$ (relative pressure) ●Record the direction of 4-way valve and the position of each vent before remove 4-way valve.

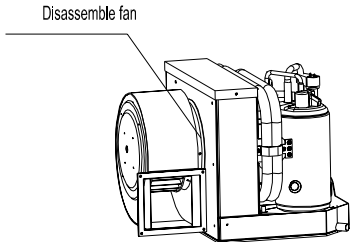
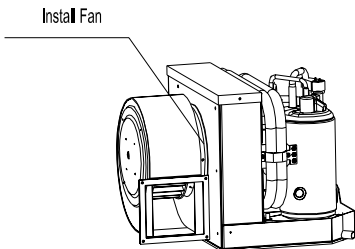
3. Remove 4-way valve		●Remove old 4-way valve from pipeline.
4. Install new 4-way valve.		●Install the new 4-way valve in correct position and connect it with pipeline correctly. ●Wrap the valve with wet cloth when welding to prevent the slide block inside the valve from burning and prevent water from piping. ●Charge nitrogen to weld and the nitrogen pressure is $0.5 \pm 0.1 \text{ kgf/cm}^2$ (relative pressure)
5. Install electromagnetic valve.		●Install the electromagnetic valve in new 4-way valve.
6. Inspect the system and charge refrigerants.		●Vacuumize and charge refrigerants after confirmation that there is no leakage of the system.

4.3. Tube in tube heat exchanger

Disassembly and Assembly of tube in tube heat exchanger		
Process	Pictorial View	Handling Description
1. Disconnect bushing from 4-way valve	 Disconnect bushing from 4-way valve	●Heat connecting pipe of bushing and 4-way valve by gas welding and then unplug bushing. ●nitrogen-fill protection shall be conducted on welding joint and the pressure of nitrogen is $0.5 \pm 0.1 \text{ kgf/cm}^2$ (relative pressure) ●Heat it with caution in case the surroundings get burnt due to high temperature
2. Unplug pipe clamp	 Unplug pipe clamp	●Unscrew the pipe clamp to disconnect the bushing from side plate of evaporator.
3. Assemble pipe clamp	 Assemble clamp	●Fix the bushing and side plate of evaporator by pipe clamp.

4. Connect the bushing with pipeline of 4-way valve		●Weld bushing by gas welding. ●nitrogen-fill protection shall be conducted on welding joint and the pressure of nitrogen is $0.5 \pm 0.1 \text{ kgf/cm}^2$ (relative pressure) ●Heat it with caution in case the surroundings get burnt due to high temperature
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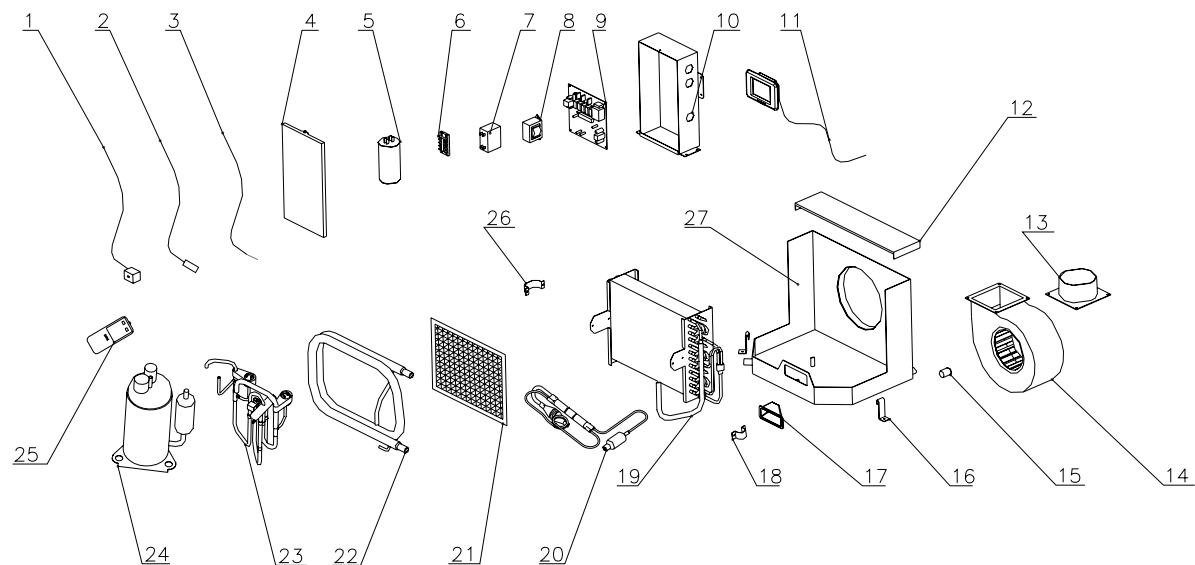
4.4. Fan and Fan Motor

Disassembly and Assembly of Fan and Fan Motor		
Process	Pictorial View	Handling Description
1. Disassemble fan		●Disassemble fan by screwdriver.
2. Install fan		●Fix the fan by screwdriver.

5. EXPLODED VIEWS AND PART LIST

1) Model: CYR7NaK

Exploded View:



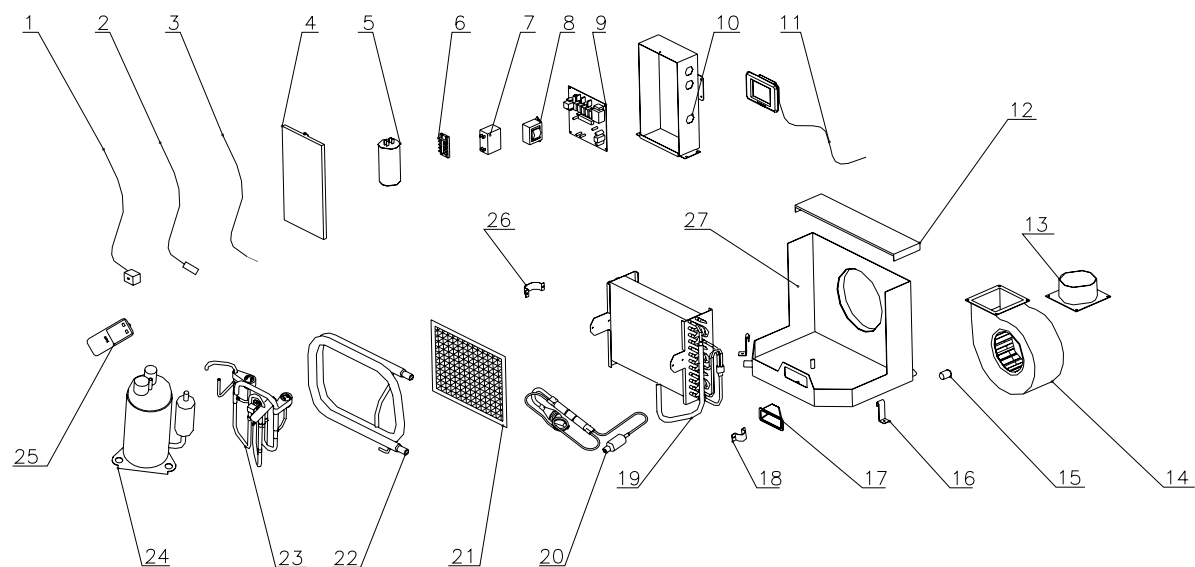
Parts List:

NO.	Name of part	Part code	Quantity
1	Reverse valve solenoid	430004005	1
2	Temperature sensor	3900020721	1
3	Temperature sensor	3900020720	1
4	Electric box cover	01419405	1
5	Capacitor	33010044	1
6	Terminal	42010254	1
7	Capacitor	33010013	1
8	Transformer	43110239	1
9	Main PCB	30225306	1
10	Electric box	01409405	1
11	Display panel	30295002	1
12	Cover assy	01259401	1
13	Duct connecter	06329402	1
14	Blower assy	15019401	1
15	Drain pipe	01279460	2
16	Clamp	01729602	4
17	Handle	26235401	1
18	Condenser fixer	021400054	1
19	Evaporator assy	01023908	1
20	Capillary assy	04103910	1
21	Filter	11129404	1
22	Condenser coil	01139404	1
23	Reverse valve assy	04143905	1
24	Compressor	00203903	1
25	Remote controller	30515028	1
26	Condenser fixer	01346002	1

27	Base/pan	01283929	1
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2) Model: CYR9NaK

Exploded View:



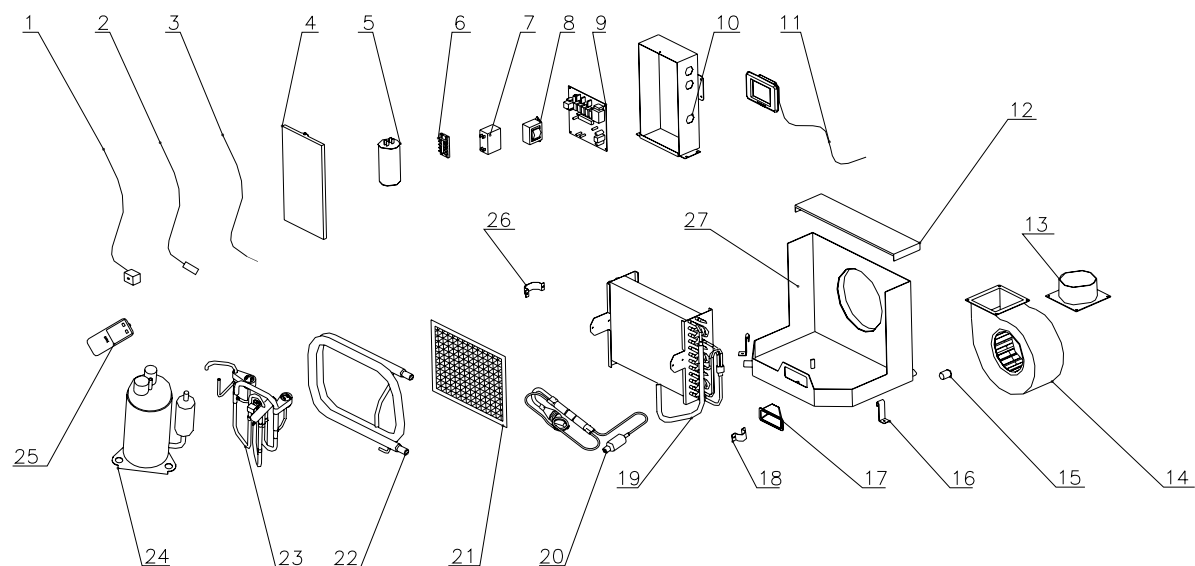
Parts List:

NO.	Name of part	Part code	Quantity
1	Reverse valve solenoid	430004005	1
2	Temperature sensor	3900020721	1
3	Temperature sensor	3900020720	1
4	Electric box cover	01419405	1
5	Capacitor	33000018	1
6	Terminal	42010254	1
7	Capacitor	33010013	1
8	Transformer	43110239	1
9	Main PCB	30225306	1
10	Electric box	01409405	1
11	Display panel	30295002	1
12	Cover assy	01259401	1
13	Duct connecter	06329401	1
14	Blower assy	150194014	1
15	Drain pipe	01279460	2
16	Clamp	01729602	4
17	Handle	26235401	1
18	Condenser fixer	021400054	1
19	Evaporator assy	01009401	1

20	Capillary assy	03009405	1
21	Filter	11129404	1
22	Condenser coil	01139401	1
23	Reverse valve assy	04143903	1
24	Compressor	00120084	1
25	Remote controller	30515028	1
26	Condenser fixer	01346002	1
27	Base/pan	01283921	1

3) Model: CYR12NaK

Exploded View:

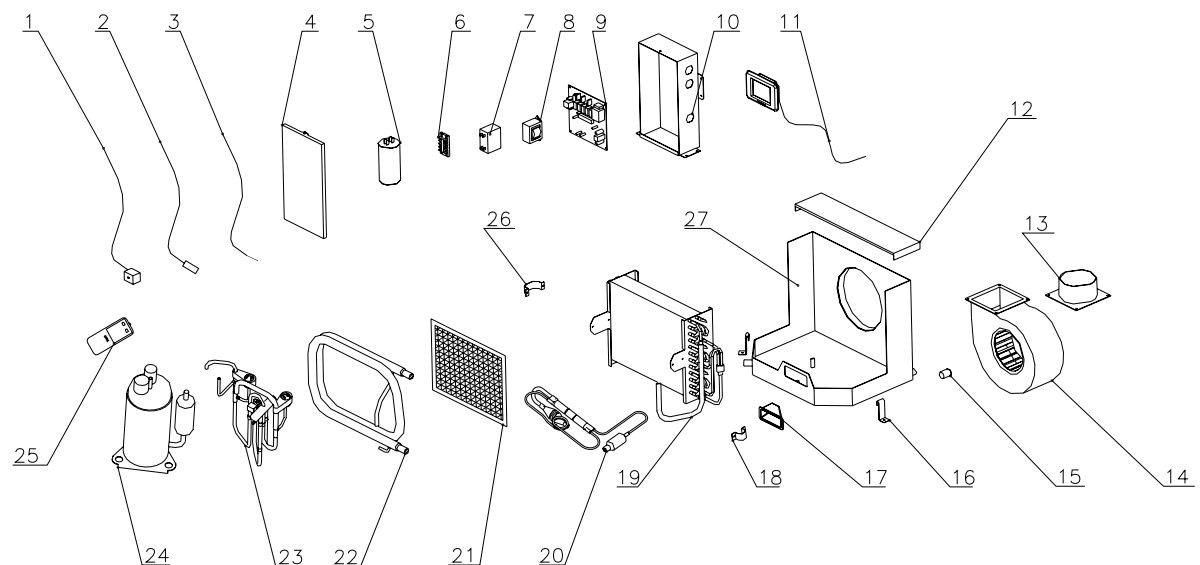


NO.	Name of part	Part code	Quantity
1	Reverse valve solenoid	430004005	1
2	Temperature sensor	3900020721	1
3	Temperature sensor	3900020720	1
4	Electric box cover	01419405	1
5	Capacitor	33010743	1
6	Terminal	42010254	1
7	Capacitor	33010010	1
8	Transformer	43110239	1
9	Main PCB	30225306	1
10	Electric box	01409405	1
11	Display panel	30295002	1
12	Cover assy	01259401	1

13	Duct connector	06329402	1
14	Blower assy	150094065	1
15	Drain pipe	01279460	2
16	Clamp	01729602	4
17	Handle	26235401	1
18	Condenser fixer	021400054	1
19	Evaporator assy	01023907	1
20	Capillary assy	04103908	1
21	Filter	11129403	1
22	Condenser coil	01139404	1
23	Reverse valve assy	04143903	1
24	Compressor	00120084	1
25	Remote controller	30515028	1
26	Condenser fixer	01346002	1
27	Base/pan	01283916	1

4) Model: CYR16NaK

Exploded View:



NO.	Name of part	Part code	Quantity
1	Reverse valve solenoid	430004005	1
2	Temperature sensor	3900020721	1
3	Temperature sensor	3900020720	1
4	Electric box cover	01419405	1
5	Capacitor	33010743	1
6	Terminal	42010254	1
7	Capacitor	33010013	1

8	Transformer	43110239	1
9	Main PCB	30225306	1
10	Electric box	01409405	1
11	Display panel	30295002	1
12	Cover assy	01259404	1
13	Duct connecter	06329402	1
14	Blower assy	150094064	1
15	Drain pipe	01279460	2
16	Clamp	01729602	4
17	Handle	26235401	1
18	Condenser fixer	021400054	1
19	Evaporator assy	01039405	1
20	Capillary assy	04103909	1
21	Filter	11129402	1
22	Condenser coil	01139405	1
23	Reverse valve assy	04143902	1
24	Compressor	00120023	1
25	Remote controller	30515028	1
26	Condenser fixer	01346004	1
27	Base/pan	01283918	1